

**TO:** Trinity Management Council  
**FROM:** Ernie Clarke, Trinity River Restoration Program  
**SUBJECT:** Klamath River Fall Flow Augmentation – Status Update  
**DATE:** May 17, 2010

**BACKGROUND:** A group was formed to evaluate Klamath River fall flows augmentation at the March 31/April 1 Trinity Management Council meeting. The group was assigned six objectives. The status of each objective is reviewed beginning on page 2 of this memo.

**PROVISIONAL FINDING:** The estimated pre-season Chinook run is average or greater in size and lower Klamath River flows are projected to be lower than established thresholds. As a result, there is concern for a fish die-off. A fall flow release may be warranted this year.

**RECOMMENDATION:** That the Northern California and Klamath Basin Area Offices of the Bureau of Reclamation reserve 35,000 acre-feet of water for a possible fall flow.

**NEXT STEPS:** By the end of June, the evaluation group will:

1. Update the lower Klamath River flow projection
2. Refine the 2010 fall flow augmentation recommendation
3. Explore the feasibility and details of an emergency trigger/release
4. Attempt to establish an annual process for addressing fall flow augmentation

**UPCOMING MEETINGS:**

1. Conference call on 6/8/10 (Tuesday) at 10AM  
TOPICS: Task update, emergency triggers, emergency response timing, monitoring, decision tree.
2. Conference call on 6/28/10 (Monday) at 10AM  
TOPICS: Updated flow projection, recommendation.

**PARTICIPANTS:** Mike Berry (California DFG), Charlie Chamberlain (USFWS Arcata), Ernie Clarke (USFWS, Weaverville), Andrea Davis (Hoopa Valley Tribe), Scott Foott (USFWS Fish Health Center), Robert Franklin (Hoopa Valley Tribe), Larry Hansen (California DFG), John Hicks (BOR, Klamath Basin Area Office), Tim Hayden (Yurok Tribe), Buford Holt (BOR, Northern California Area Office), Seth Naman (NOAA Fisheries), Joe Polos (USFWS, Arcata), Josh Strange (Yurok Tribe), Eric Wiseman (USFS)

## **Review of Findings/Recommendations by Objectives**

### **Objective 1. Compile available information**

- Summary of 2002 die-off:
  - In September 2002 a massive die-off of salmon occurred in the lower Klamath River.
  - At least 33,000 adult salmonids died in the lower 36 miles of river.
  - The primary cause of the die-off event was an epizootic event from the ubiquitous pathogens Ich and columnaris.
  - However, several factors contributed to stressful conditions for fish, including an early and high density of Chinook salmon, low flows and high water temperatures.
- Information sources include:
  - U.S. Fish and Wildlife Service. 2003. Klamath River Fish Die-off, September 2002: Estimate of Mortality. Report Number. AFWO-01-03. 35pp.
  - U.S. Fish and Wildlife Service. 2003. Klamath River Fish Die-off, September 2002. Causative Factors of Mortality. Report Number AFWO-F-02-03. 128pp.
  - California Department of Fish and Game. 2004. September 2002 Klamath River Fish Kill: Final analysis of contributing factors and impacts.
  - Trinity River Restoration Program. 2004. Recommendations of the Trinity River Restoration Program for fall releases into the Trinity River.
  - Yurok Tribe Fisheries Department. 2004. The Klamath River Fish Kill of 2002; Analysis of Contributing Factors. By M. Belchik, D. Hillemeir and R. Pierce. Feb. 2004. 42 p.

### **Objective 2. Review triggers established previously and determine if they were beneficial.**

- Two types of triggers exist: (1) Proactive and (2) Emergency
- Proactive triggers
  - Used to prompt a proactive or preventative release. The objective of such a release is to reduce the likelihood of a large scale fish die-off by ensuring conditions known to be adequate for adult up migration through the lower Klamath River.
  - Include (1) projected fall Chinook run sizes ( $\geq$  average) in combination with (2) projected flows in the lower Klamath River (2200 cfs Orleans + Hoopa; 2500 cfs at Terwer).
  - Die-offs did not occur during years when Fall flows were augmented. Negative impacts have not been documented.
- Emergency triggers

- Used to prompt an emergency release. The objective of such a release is to reduce the severity of a fish die-off
- Triggers related to water temperature, fish behavior, estuary configuration, disease monitoring, incidence of dead fish, and fish density have been proposed in previous years.
- Emergency release could be tied primarily to one of these emergency triggers: disease monitoring.
- Uncertain if the response time was rapid enough to allow real-time monitoring to be used to reduce the severity of a fish die-off.

**Objective 3. Develop forecast for the lower Klamath at Terwer to determine if triggers are likely to be tripped.**

- May forecast indicated flows might be less than the established thresholds.
- Intend to update the forecast in late June and to develop a better prediction for the recurrence interval for late summer low flow

**Objective 4. If so, what would alleviate the problem? Consider solutions on both sides.**

- Group recommends that BOR reserve 35,000 acre-feet of water for a possible fall flow. Water could be reserve on the Trinity or Klamath.

**Objective 5. If so, would it be helpful to release additional Trinity water?**

- Perhaps. Answer depends on both the June forecast and the availability of Klamath water.

**Objective 6. If so, how?**

- Mimic a natural storm event to the extent possible. A recommended release schedule will be provided in June.

